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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/026,431

12/27/2001

Toshihiko Igashira

2635-49

1558

23117

7590

02/27/2004

NIXON & VANDERHYE, PC  
1100 N GLEBE ROAD  
8TH FLOOR  
ARLINGTON, VA 22201-4714

EXAMINER

EVANS, ROBIN OCTAVIA

ART UNIT

PAPER NUMBER

3752

DATE MAILED: 02/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/026,431

Applicant(s)

IGASHIRA ET AL.

Examiner

Robin O. Evans

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-12 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.4.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Oath/Declaration***

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c).

### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because the abstract exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. Claims 1-8 and 10-12 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Igashira et al. (6,679,440).

Igashira et al. shows a fuel injector having a hydraulic control valve with a piezoelectric actuator 14, large diameter piston 16, small diameter piston 18, control chamber 4, and valve member 52. Also note figure 1.

As to the recitation of the “hydraulic valve mechanism being so designed that said piezoelectric actuator produces a maximum output force working to develop the hydraulic pressure when opening the fluid port through the valve member, the maximum output force decreasing after the fluid port is opened and being set smaller than one-half of a maximum possible output force of said piezoelectric actuator under application of a maximum working voltage to said piezoelectric actuator”, since Igashira et al. shows all of the structural limitations as recited by the instant claims including a difference between areas of the pistons which determines the amplification and output force of the actuator (as described by the applicant on page 6, lines 5-19 of the specification), it is deemed that Igashira et al. will inherently meet the functional limitation during normal use of the device. However if not, since Igashira et al. also discloses in column 5, lines 61-65 that specifically, the stroke of the large-diameter piston is amplified through the fuel within the displacement amplifying chamber as a function of a difference in diameter between the large-diameter piston and the small diameter piston and that the degree of expansion of the piezoelectric actuator corresponds to a sectional area ratio of the large-diameter piston to the small-diameter piston, it is deemed that the hydraulic valve mechanism will be so designed by the user having a desired result in mind and so it would have been obvious to one of ordinary skill in the art to have designed Igashira’s valve, if not already,

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with a valve which produces a maximum output force that decrease after the fluid port is opened and being set smaller than one-half of a maximum possible output force so as to achieve a desired fuel injection cycle as needed by the engine.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

5. Claims 1-8 and 10-12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hays, Jr. (5,779,149).

Hayes, Jr. shows a fuel injector having a hydraulic control valve with a piezoelectric actuator 8, large diameter piston 9, small diameter piston 11, control chamber 5, and valve member 12. Also note figures 1-3.

As to the recitation of the "hydraulic valve mechanism being so designed that said piezoelectric actuator produces a maximum output force working to develop the hydraulic pressure when opening the fluid port through the valve member, the maximum output force decreasing after the fluid port is opened and being set smaller than one-half of a maximum possible output force of said piezoelectric actuator under application of a maximum working voltage to said piezoelectric actuator", since Hayes, Jr. shows all of the structural limitations as recited by the instant claims including a difference between areas of the pistons which determines the amplification and output force of the actuator (as described by the applicant on

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page 6, lines 5-19 of the specification), it is deemed that Hayes Jr. will inherently meet the functional limitation during normal use of the device. However if not, since Hayes also discloses in column 3, lines 49-68 that the difference between the effective surface areas of the two pistons will determine the stroke and that the quantity of fuel injected depends on the duration and modulation of the electrical signal provided to the actuator, it is deemed that the hydraulic valve mechanism will be so designed by the user having a desired result in mind and so it would have been obvious to one of ordinary skill in the art to have designed Hayes' valve, if not already, with a valve which produces a maximum output force that decrease after the fluid port is opened and being set smaller than one-half of a maximum possible output force so as to achieve a desired fuel injection cycle as needed by the engine.

***Allowable Subject Matter***

6. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Heinz et al., Potschin et al. Igashira et al. (6,367,453) all show devices in the general state of the art of the invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robin O. Evans whose telephone number is (703) 305-5766. The examiner can normally be reached on Monday-Thursday, 6:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mar can be reached on (703) 308-2087. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Robin O. Evans  
Primary Examiner  
Art Unit 3752

2/21/04

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